PROPOSED

Permit Application Review for
Temporary Covered Source Permit (CSP) No. 0580-01-CT

Application No.: 0580-01

Applicant: Kalaka Nui, Inc.
92-111 Ulele Place
Kapolei, HI 96707
Phone: 682-0801

Facility Title: One (1) 350 TPH Impact Crusher with One (1) 300 HP Diesel Engine

SIC Code: 1429, Crushed and Broken Stone

Location: Various Temporary Sites, State of Hawaii

Proposed initial location: Facility baseyard, 91-008 Hanua Street, (Campbell Industrial Park), Kapolei, Oahu.
UTM Coordinates: 593,213 m East; 2,355,208 m North, NAD-83, Zone 4

Responsible Official: Nowel Dudoit-Alana
President

Contact Person: Jim Morrow
Env. Mgt. Consultant
942-9096

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Kapolei, Hawaii 96707

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1. Equipment Description:

Type	Manufacturer	Model/ SN	Year Mfg'd	Description	Power Source / Fuel
350 TPH [a] Crusher	The Screen Machine	Model: 4043T SN: D4043TCJE1789	2005	40" x 43" Impact Crusher with Grizzly feeder	Diesel Engine listed below
300 HP [a] Diesel Eng.	Caterpillar	Model: C-9; SN: same as above	2005	Drives Grizzly feeder, crusher and conveyors	Diesel # 2 max 15.0 gph[a]

[a] Based on manufacturers' specifications.

2. Background:

2.1 The application for the covered source permit was submitted on April 7, 2005 with a fee of $1,000.

2.2 In response to my questions, Mr. Jim Morrow responded with the following additional information by email on May 3 and 5, and June 1, 2005:

a. Diesel engine manufacturer's "not to exceed" data for NOx, CO, VOC, and PM.

b. Average tare weight of trailer-trucks of 15 tons, and GVW of 39 tons.

c. Crusher and diesel engine manufacture date of 2005.

d. An alternate operating scenario for a replacement DE is not feasible.

3. Proposed Project:

The applicant proposes to use the 350 TPH 4043T crushing plant to process and crush basalt rock and concrete rubble for construction projects, backfill material and recycling. The crushing process involves depositing raw material into the grizzly feeder by a front-end loader. From the feeder the material is moved directly into the impact crusher. Undersize material is transported from the feeder via conveyor belt to a stockpile on the side of the crusher. The rest of the material travels through the crusher and onto another conveyor belt which transports it to a second stockpile.

The crushing plant is equipped with tracks and is therefore mobile. It is also equipped with a magnetic belt to remove metal from recycled concrete. It is powered by a built-in 300 HP Caterpillar diesel engine. The crusher may be deployed by trailer to other job sites as necessary.

Operations will be irregular depending on job availability and contractors' requirements. Typically, the crushing plant will be operated 8 hr/day, 5 days/week, 52 weeks/year. However, there are times when the plant will sit idle. No operational hour limits were proposed by the applicant.

4. Air Pollution Controls:

4.1 Air pollution control on the crushing system will be accomplished by water sprays at the following points:

a. At the grizzly feeder;
b. At the transfer point to the under-conveyor; and
c. At the transfer point to the stockpile.

4.2 Air pollution control on the diesel engine will be accomplished by:

a. The engine's inherent turbocharging and aftercooling features which reduce NOx emissions;
b. Good maintenance to reduce CO, VOC and PM emissions; and
c. Use of low sulfur fuel (0.5% by wt.)

5. Applicable Requirements:

Hawaii Administrative Rules (HAR)
- Title 11 Chapter 59, Ambient Air Quality Standards
- Title 11 Chapter 60.1, Air Pollution Control
  - Subchapter 1 - General Requirements
  - Subchapter 2 - General Prohibitions
    - 11-60.1.31 Applicability
    - 11-60.1-32 Visible Emissions
    - 11-60.1-33 Fugitive Dust
    - 11-60.1-38 Sulfur Oxides from Fuel Combustion
  - Subchapter 5 - Covered Sources
  - Subchapter 6 - Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
    - 11-60.1-111 Definitions
    - 11-60.1-112 General Fee Provisions for Covered Sources
    - 11-60.1-113 Application Fees for Covered Sources
    - 11-60.1-114 Annual Fees for Covered Sources
  - Subchapter 8 - Standards of Performance for Stationary Sources
    - 11-60.1-161(27) Standards of Performance for Non-metallic Mineral Processing Plants
  - Subchapter 10 - Field Citations

5.1. This source is subject to the following **New Source Performance Standards (NSPS)**:
- 40 CFR Part 60 - Standards of Performance for New Stationary Sources
  - Subpart A - General Provisions
  - Subpart OOO - Standards of Performance for Non-metallic Mineral Processing Plants

40 CFR Part 60 Subpart OOO applies to portable crushed stone plants with capacities greater than 150 TPH that commence construction, reconstruction, or modification after August 31, 1983. The 350 TPH (Model No. 4043T) crushing plant and its conveyors meet these conditions and were determined subject to Subpart OOO.

Annual source performance testing and monthly visible emissions observations shall be required for crusher. Monitoring, recordkeeping, notification, and reporting requirements will be included in the permit to ensure monthly V.E. observations, as well as to ensure annual source performance testing of the equipment.

5.2. This source is not subject to **Prevention of Significant Deterioration (PSD)** requirements because it is not a major stationary source, as defined in HAR Title 11, Chapter 60.1, Subchapter 7 and 40 CFR Part 52, Section 52.21.

5.3 This source is not subject to **National Emission Standards for Hazardous Air Pollutants (NESHAPS)** as there are no standards in 40 CFR Part 61 applicable to this facility (crushing and screening plant operations).

5.4 This source is not subject to **Maximum Achievable Control Technology (MACT)** as the facility is not a major or area source of HAPS, covered under 40 CFR Part 63.

5.5 A **Best Available Control Technology** (**BACT**) analysis is required for new sources and significant modifications to sources that have the potential to emit or increase emissions above "significant levels", as defined in HAR, Section 11.60.1-1, considering any limitations, enforceable by the director, on the source to emit a pollutant. This facility is a new covered source and its potential emissions at any location were calculated to be less than the "significant" thresholds (see table below). Therefore, a BACT analysis was not performed at this time.

5.6 **Compliance Assurance Monitoring (CAM) Applicability**: 40 CFR Part 64 - The purpose of Compliance Assurance Monitoring (CAM) is to provide reasonable assurance that compliance is being achieved with large emission units that rely on air pollution control device equipment to meet an emissions limit or standard. For CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential precontrol emissions that are greater than the major source level; and (5) not otherwise be exempt from CAM. The facility remains exempt from Compliance Assurance Monitoring (CAM) provisions because this source is not a major source.

5.7 **Consolidated Emissions Reporting Rule (CERR) Applicability**: 40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines CERR based on facility wide emissions of each air pollutant at the CERR triggering levels shown below. This facility does not have any emissions at the CERR triggering levels. Therefore, CERR requirements are not applicable.

Although CERR for the facility is not triggered, the Clean Air Branch requests annual emissions reporting from those facilities that have facility-wide emissions of a single air pollutant exceeding in-house triggering levels. Annual emissions from these facilities are used within the Department and are not inputted into the AIRS database. Total combined emissions from this facility do not exceed these levels. However, annual emissions reporting is required for all covered sources.

Maximum Emissions Compared to Significant Levels, CER, and "In-house" Thresholds (All Values in TPY)

Pollutant	Facility-Wide Emissions [a]	Significant Levels	CERR Triggering Levels (TPY)		"In-house" Reporting Levels
			1-Year Cycle (Type A Sources)	3-year Cycle (Type B Sources)	
NOx	16.92	40	≥ 250	≥ 100	≥ 25
CO	2.70	100	≥ 2500	≥ 1000	≥ 250
SO2	4.64	40	≥ 2500	≥ 100	≥ 25
PM-10 [b]	9.05	15	≥ 250	≥ 100	≥ 25
PM [b]	19.94	25	--	--	≥ 25
VOC	0.64	40	≥ 250	≥ 100	≥ 25
Pb	--	--	--	--	≥ 5

[a] Based on 350 TPH Crusher and the 300 HP D.E. operating 8,760 hr/yr.

[b] Does not include PM emissions from vehicle travel on unpaved roads.

5.8 **Major source/ Synthetic minor source applicability**:

A synthetic minor source is a facility that is potentially major (as defined in HAR 11-60.1-1), but is made nonmajor through federally enforceable permit conditions (e.g., limiting the facility's hours of operation and limiting the facility's production rate). This facility is not a synthetic minor based on emission levels less than "major" levels (< 100 TPY) and HAPs less than 10 TPY when the crushing plant and diesel engine are operated at 8,760 hr/yr.

6. Insignificant Activities/Exemptions:

A 175 gallon diesel fuel tank that stores fuel for the diesel engine is an insignificant activity in accordance with HAR 11-60.1-82(f)(1) because it is less than 40,000 gallons and is not subject to any standard or other requirement pursuant to Section 111 or 112 of the CAA. This tank is not subject to NESHAPS as there are no standards in 40 CFR Part 61 applicable to this source. It is also not subject to NSPS as there are no applicable regulations in 40 CFR Part 60 pertaining to this fuel tank.

7. Alternate Operating Scenarios:

The applicant indicated that an alternate operating scenario is not feasible for the DE which is built into the chassis of the crushing plant.

8. Project Emissions:

8.1 Rock Crushing Operations.

Particulate matter emissions from the crushed stone processing are summarized below and calculations are shown in Enclosure (1). Emission calculations were based on the maximum capacity of the crusher (350 TPH) operating unrestricted at 8,760 hr/yr, per the applicant's proposal.

Rock Crushing Operations (8,760 hr/yr)	
Pollutant	Emissions [a] (TPY)
PM-2.5	1.00
PM-10	2.63
PM	6.64

[a] AP-42, 11.19.2 (8/04), Crushed Stone Processing

8.2 Stockpiles. Worst case emissions from aggregate handling and storage piles were based on the maximum production rate of the crusher (350 TPH) operating 8,760 hr/yr. Particulate emissions are summarized below and shown in Enclosure (2).

Stockpile Emissions (8,760 hr/yr)	
Pollutant	Emissions [a] (TPY)
PM-2.5	1.94
PM-10	6.16
PM	13.04

[a] AP-42, Section 13.2.4 (1/95), Aggregate Handling and Storage Piles.

8.3 Vehicle Travel on Unpaved Roads**.** Particulate emissions from vehicle travel on unpaved roads were calculated using AP-42, Section 13.2.2 (12/03), "Unpaved Roads." Worst-case emission rates were based on the following assumptions:

a. Calculations for vehicle miles traveled (VMT) per year were based 0.2 miles round-trip travel per truckload into and out of the facility, an average truck's load capacity of 24 tons, and the maximum production rate of the crusher (350 TPH), 8,760 hr/yr operation, and 27 tons average weight of the trucks. Vehicle miles traveled per year (VMT/yr) at the facility was calculated to be 25,550 miles.

b. k (particle size multiplier) values for PM, PM-10, and PM-2.5 of 4.9, 1.5 and 0.23, respectively, based on updated information from AP-42.

c. An s (silt content of road) value of 10% for a processing plant road.

e. A p (# of days with 0.01" of rain/year) value of 81 based on available data from the Honolulu Observatory site 702.2 (www.wrcc.dri.edu/cgi-bin) .

f. A 70% control efficiency was applied to account for dust control from the water truck.

g. Based on the above, particulate matter emissions from vehicle travel on unpaved roads are summarized as follows and detailed in Enclosure (3):

Vehicle Travel on Unpaved Roads	
Pollutant	Emission (TPY)
PM-2.5	1.57
PM-10	10.22
PM	34.59

8.4 Diesel Engine Emissions. Emissions from the crusher's 300 HP Caterpillar diesel engine are based on the following and are shown in enclosure (4) and summarized in the table below:

- Fuel consumption rate of 15.0 gal/hr.
- Diesel fuel heating value of 137,000 BTU/gal and 0.5% Sulfur content.

Emissions from 300 HP Diesel Engine

Pollutant	Emission Factor (lb/MMBtu)	Emission (lb/hr)	Emission (TPY)
NO_X [a]	1.88	3.863	16.922
CO [a]	0.3	0.617	2.700
SO_2	mass balance	1.059	4.638
PM-2.5 [b]	0.0261	0.054	0.235
PM-10 [a]	0.029	0.060	0.261
PM [a]	0.03	0.060	0.261
Aldehydes	0.07	0.144	0.630
TOC [a]	0.071	0.146	0.639
TOTAL HAPS (shaded)			5.73E-02

[a] EFs from mfg's data. All other Efs from AP-42, Tables 3.3-1 and -2 (10/96)

[b] PM-2.5 = 90% of PM (AP 42, Appendix B-2, pg B.2-11, 9/90)

8.5 Facility Wide Emissions Facility-wide emissions from the facility operating 8,760 hr/yr and are tabulated below and at enclosure (5). A major source as defined in Section 11-60.1-1 of HAR Title 11, has the potential to emit any HAP of 10 TPY or more, or 25 TPY or more of any combination of HAPs, or 100 TPY or more of any air pollutant. Calculated emissions do not meet these limits and thus, this facility is not classified as a major source, in compliance with regulations for temporary sources.

FACILITY-WIDE EMISSIONS (TPY)— Crusher Operating 8,760 Hr/yr					
Pollutant	300 HP Diesel Engine	350 TPH Crusher	Stockpile	Vehicle Travel	Total Emissions
NOx	16.92	--	--	--	16.92
CO	2.70	--	--	--	2.70
SO2	4.64	--	--	--	4.64
PM-2.5	0.23	1.00	1.94	1.57	4.73
PM-10	0.26	2.63	6.16	10.22	19.26
PM	0.26	6.64	13.04	34.59	54.53
VOC	0.64	--	--	--	0.64
HAPs	5.73E-02	--	--	--	5.73E-02

9. Air Quality Assessment:

The ambient air quality standards seek to protect public health and welfare and to prevent the significant deterioration of air quality. For new facilities and facilities proposing modifications, an ambient air quality assessment is required to analyze the maximum potential pollutant concentrations generated by a source and its effect on the ambient air.

The Department of Health generally exempts an applicant from performing an ambient air quality impact analysis for (1) existing sources with no proposed modifications, (2) exempt activities, (3) fugitive emission sources (e.g., storage tanks, storage piles, pipe leaks, etc.), and (4) intermittent operating noncombustion sources.

For this application, the 300 HP Caterpillar diesel engine, which is situated on the chassis of the crushing plant, requires an Ambient Air Quality Impact Analysis (AAQIA).

A Good Engineering Practice (GEP) stack height analysis was performed (see table below) using the dimensions of the crusher/DE structure itself.

Results from the analysis, as tabulated below, indicated the physical height of the diesel engine's stack (4.11 m) is less than the GEP formula stack height of 9.0 m based on the dimensions of the crushing plant as a worst case scenario.

GOOD ENGINEERING PRACTICE STACK HEIGHT (All dimensions in meters)

Structure	Hgt	Length	Width	PW *	L	Hg **	Stack hgt
Crusher/D.E.	3.6	14.5	3	14.81	3.6	9	4.11

* Projected Width

** Hg (GEP stack height) = Height + 1.5 L, where L is smaller of PW or structure hgt.

Since the GEP stack height is less than the DE's actual stack height, the crusher's dimensions were inputted into the SCREEN3's model to account for downwash effects.

Background air quality data for the AAQIA was obtained from the State of Hawaii Department of Health's Annual Summary Hawaii Air Quality Data, 2003. Data collected at the monitoring stations located at West Beach (Ko'Olina Golf Course) for PM-10, SO_2 and NO_2, and at Kapolei (2052 Lauwiliwili St.) for CO, were used for the analysis.

A BEE-Line's Screen 3 model was used for the analysis and the crushing plant's dimensions were used for downwash effects. Assumptions for the model included the following:

a. Simple terrain impacts;
b. Rural dispersion parameters;
c. Wake effects from the Trakpactor structure;
d. Default meteorology;
e. EPA scaling factors of 0.9, 0.7, and 0.4 for the 3-hour, 8-hour, and 24 hour concentrations, respectively;
f. State of Hawaii scaling factor of 0.2 for the annual concentrations.

The table below presents the potential to emit and stack parameters used in the AAQIA. The derivation of the sulfur dioxide, oxides of nitrogen, carbon monoxide, and particulate matter emissions were previously discussed in the project emissions section. Hydrogen sulfide and lead emission factors were not available in AP-42 and should be negligible; therefore, they were not evaluated in the air modeling. The ozone limiting method was used to determine the NO_2 concentrations.

SOURCE EMISSION RATES AND STACK PARAMETERS FOR AIR MODELING									
Equipment	Stack No.	EMISSION RATES (g/s)				SOURCE STACK PARAMETERS			
		SO_2	NOx	CO	PM	Hgt (m)	Temp (K)	Vel. (m/s)	Diam. (m)
300 HP Caterpillar D.E.	1	0.133	0.487	0.078	0.008	4.11	696	107.53	0.102

Receptors were located in areas considered ambient air. These areas were outside of the property boundary of the facility. SCREEN 3's default set-up placed the initial receptor one meter downwind of the diesel engine's stack. Thereafter, receptors were placed every 100 meters from the stack up to a maximum radial distance of 50,000 meters. The maximum 1 hour concentration of 869.2ug/m^3 was predicted at a distance of 26 meters from the stack. (Output summary at Encl (6)).

The predicted concentrations in the table below assumed 8,760 hours of operation per year and an annual fuel consumption of 131,400 gal/yr. Background concentrations were also considered and added to the total impact. Based on these assumptions, the emissions impact from the 300 HP diesel engine will comply with state and federal ambient air quality standards as shown in the table below.

PREDICTED AMBIENT AIR QUALITY IMPACTS [a]								
AIR POLLUTANT	EMISS. RATE (g/s)	AVG. TIME	SCALING FACTOR	IMPACT [b] (ug/m3) 2,500 hr/yr	BCKGRD [c] (ug/m3)	TOTAL IMPACT (ug/m^3)	AIR STD (ug/m^3)	% OF STD
SO2	0.133	3-Hour	0.9	104.38	16	120	1,300	9%
		24-Hour	0.4	46.39	4	50	365	14%
		Annual	0.2	23.20	0.2	23	80	29%
NOx [d]	0.487	Annual	0.2	39.13	8	47	70	67%
CO	0.078	1-Hour	1	67.52	2,166	2234	10,000	22%
		8-Hour	0.7	47.26	841	888	5,000	18%
PM-10	0.008	24-Hour	0.4	2.61	33	36	150	24%
		Annual	0.2	1.31	16	17	50	35%

[a] Based on maximum 1 hour concentration of **869.2** ug/m3 per g/sec 26 meters from the stack.

[b] IMPACT = (Emiss. Rate) X (Scaling factor) X (869.2 ug/m^3).

[c] Background data from monitoring stations located at West Beach (Ko'Olina Golf Course) for PM-10, SO2 and NO2, and at Kapolei (2052 Lauwiliwili St.) for CO

[d] The ozone limiting method was used to determine the NO_2 concentrations as follows:
Annual concentration of NOx for the equipment is 869.2 X 0.487 X 0.2 = 84.62 ug/m^3
84.62 > 32 ug/m3 (backgrg ozone concentration at the Sand Is. Monitoring station, 2003).
Therefore, the equipment is O_3 limited since there is insufficient ozone to convert all the NO to NO2.
It was assumed that 90% of the nitrogen oxides discharged from the stack form NO and 10% form NO2.
Therefore, the concentration of NO2 emitted from the stack is calculatted as follows:

Impact = (emission rate) X (scaling factor)X (Max concentration) X 10%
= 84.62 X 0.1
= 8.46 ug/m^3
(Bckgrd O3) X (NO2/O3) = 32 X (46/48)
= 30.67 ug/m^3
Total NO2 = 8.46 + 30.67 = **39.13** ug/m^3

10. Significant Permit Conditions:

Condition: The 350 TPH 4043T crushing plant is subject to the provisions of the following federal regulations:

a. 40 CFR Part 60, Standards of Performance for New Stationary Sources, Subpart A, General Provisions; and
b. 40 CFR Part 60, Standards of Performance for New Stationary Sources, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants.

Purpose: To specify the new unit as subject to the federal regulations listed above.

Condition: The permittee shall take measures to control fugitive dust (e.g., wet suppression, enclosures, dust screens, etc.) at the crushing plant, material transfer points, stockpiles, and throughout the facility. On the crushing plant, water spray bars shall be installed, maintained, and utilized as necessary at the following material drop off points:

(1) At the grizzly feeder;
(2) At the transfer point to the under-conveyor; and
(3) At the transfer point to the stockpile.

Purpose: PM emissions from the facility were calculated by assuming a 70% control efficiency for use of water suppression systems. If the above air pollution control actions are not practiced by the applicant when necessary, PM emissions from the facility may exceed major source levels.

11. Conclusion and Recommendation:

Actual emissions from this facility should remain lower than estimated because:

1) The calculated emissions for the proposed crushing plant and its associated diesel engine were based on the worst possible potential conditions (maximum rated capacity of the crusher (350 TPH) and maximum fuel feed rate of the diesel engine (15 gph)). Actual crushing rate will vary depending on product size and the type of material and will typically be less than the maximum capacity, and the diesel engine will not run at its full power rating.

3) Calculated emissions were conservative and based on operating 8,760 hr/yr. The applicant indicated that they would typically operate at a maximum of 40 hr/week, or about 2,080 hr/yr.

Based on the information submitted by Kalaka Nui, Inc., it is the preliminary determination of the Department of Health (DOH) that the proposed project will be in compliance with the Hawaii Administrative Rules (HAR), Chapter 11-60.1 and 11-59 and not cause or contribute to a violation of any State or National ambient air quality standard. Therefore, the Hawaii DOH intends to issue Temporary Covered Source Permit No. 0580-01-CT, subject to the significant permit conditions and EPA review.

WK 5/9/05 *Draft*